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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/884,720	06/19/2001	Richard R. Hengst	6096-01	2520

7590 01/10/2003

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EXAMINER

KACKAR, RAM N

ART UNIT	PAPER NUMBER
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1763

7

DATE MAILED: 01/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application N .	Applicant(s)	
	09/884,720	HENGST, RICHARD R.	
	Examiner	Art Unit	
	Ram N Kackar	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 December 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 and 28-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 and 28-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Election of claims 1-16, drawn to an apparatus, is acknowledged.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-6 and 9-15 are rejected under 35 U.S.C. 102(b) or 102(e) as being anticipated by Inaba et al (JP 11016993) which later became (US Patent 6093644).

Inaba et al disclose a vertical wafer boat for supporting silicon wafers having ceramic body (Fig 1 and Col 1 line 34) having ceramic coating to prevent migration of impurities (Col 1 line 20) and surface finish over the coating to prevent slip in substrates of large diameters (Col 1 line 20) and at high temperature (Col 1 line 13).

Inaba et al disclose the finish to have a maximum roughness of less than 10 μm and an impurity of less than 0.1 ppm (Col 3 line 14 and 15).

Also disclosed are horizontal base (Fig 1-13), top plate (Fig 1-12), support rods (Fig 1-11), plurality of slots (Fig -14), each having ceramic coating and surface finish (Col 2 line 47).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inaba et al (JP 11016993) which later became (US Patent 6093644) in view of Lu et al (US 5904778).

Inaba et al disclose ceramic coating of silicon carbide but do not disclose its thickness. Lu et al disclose SiC coating on sintered Silicon carbide being 100µm or less (Col 6 line 21-23).

Therefore it would have been obvious for one having ordinary skill in the art at the time invention was made to have a thickness of less than 100 microns because too thick a layer may have a tendency to peel.

6. Claims 16 and 28-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inaba et al (JP 11016993) which later became (US Patent 6093644) in view of Larry S Wingo (US 6171400).

Inaba et al disclose a wafer boat but do not disclose a stress relief slot and location notch.

Wingo discloses wafer boat having both stress relief slot and notches at the base (Fig 1).

Therefore it would have been obvious for one having ordinary skill in the art at the time invention was made to use the teaching of Wingo so as to be able to avoid problem due to thermal expansion and be able to place correctly on processing platform.

Regarding claims 28-32:

Inaba et al disclose all the limitations of these claims except the support area.

Wingo discloses a support surface less than ½ of the wafer area while being cognizant of the importance of support area for prevention of slip (Abstract).

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Therefore it would have been obvious to one of ordinary skill in the art at the time invention was made to have a support structure like that of Wingo so as to be able to handle wafers for load/unload.

Response to Amendment

7. Applicants arguments filed 12/28/2002 have been considered but not found to be persuasive. Applicant's arguments and examiners response follows:

Applicant: No value or range of surface roughness is claimed in Inaba.

Examiner: A Rmax of less than 10 micron is clearly disclosed in the Abstract and Col 2 first paragraph. Applicant is trying to read more than what is disclosed in the table II. The disclosure does not mean that Rmax could not be less than 3.2 micron or it would not be desirable to be less than 3.2. It only means that particle adhesion was tested at that range. There is a very clear teaching in Inaba et al that slip lines become extremely conspicuous above a roughness of Rmax > 10 micron. That would be already out of an acceptable range. Inaba et al further explain the reasoning in favor of low roughness in paragraph 2. Inaba et al in effect warn against high roughness. There would have been no reason for them to limit the roughness to any arbitrary low value and they did not. The teaching related to roughness combined with that of support as related to slip, in Inaba et al and Wingo (Abstract) would have provided enough motivation to one of ordinary skill to arrive at the claimed invention.

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Applicant: Examiner either take official notice or provide an affidavit attesting that there is correlation between R_{max} and R_a .

Examiner: Memo provided by the applicant attests to that. R_{max} will always be more than R_a .

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ram N Kackar whose telephone number is 703 305 3996. The examiner can normally be reached on M-F 8:00 A.M to 5:P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on 703 308 1633. The fax phone numbers for the

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organization where this application or proceeding is assigned are 703 872 9310 for regular communications and 703 872 9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0661.

RK

January 8, 2003


GREGORY MILLS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1760